Science 301

Conducting and Reporting Scientific Research

Winter Quarter - 2017

1) **Course Information**

Credits: 3 undergraduate credits

Meeting Times: Tuesday & Thursday, 1:00 to 2:20 pm; January 9 – March 17, 2017

Location: Beaverhead, Room 116

2) **Instructor Information**

Name: *Wren Walker Robbins* ***[Dr. Wren]***

Email: *address: wren_walkerrobbins@skc.edu*

Office: *Beaverhead, Room 120*

Office Phone*: 275-4780, Cell: [612] 615-2605*

Office Hours*:*

- Monday & Wednesday, 1:00 – 3:00 PM
- Tuesday & Thursday: 10:00 – 11:00 AM
- Note: I also supervise student practicums in the schools so my schedule can sometimes be unpredictable. Please contact me by email to make a firm appointment.

3) **Required Materials**

All materials required for this course can be found posted on the SKC Moodle under the course rubric SCID 301 or on the Internet. Information for accessing course materials will be provided by the instructor.

4) **Course Description**

This course serves students from the Bachelor of Secondary Science Education degree program. In the course, students will design and conduct a scientific research project and will report their work in an original student-generated research paper.

5) **Course Objectives**

Through the successful completion of this course, students will

A. advance their knowledge of the nature of science and how scientific knowledge is generated by designing, conducting and reporting on a rigorous scientific research project, (Critical Thinking and Communication)

B. improve their ability to collaborate with others by working with a mentor(s) in designing their research project, (Communication)
C. develop proficiency in scientific writing by generating an original scientific paper reporting their research, (Communication)
D. hone skills in the analysis and graphic representation of data by preparing their research project data for inclusion in their scientific paper, (Communication) and
E. by reflecting on their experiences in this course, deepen their knowledge regarding teaching secondary science students about the nature of science. (Critical Thinking)

6) Course Requirements and Behavioral Expectations

A. You are studying to become a teacher. Successful teachers must have a high level of self initiative and self responsibility and should be able to work constructively as part of a team. You will find all of these scenarios in this course and you are expected to demonstrate a high level of function in each.
B. All course assignments, each completed to at least a level of proficiency equivalent to a B, are required in order to pass this course.
C. Your full attention is also expected during class activities. No communication technology should be visible, turned on, or in use during class unless they are directly related to a course activity – this includes cell phones, tablets, and laptops.
D. You are responsible for communicating directly with the instructor concerning all aspects of the course including attendance and assignments. Do not expect others to deliver messages to the instructor.
E. You must use your SKC student e mail account for all communication regarding the course, including communicating with the instructor. You are expected to submit all of your assignments electronically unless otherwise specified.

7) Evaluation

Students enrolled in the course will receive a traditional letter grade. Students will be evaluated using listed assignments (see below) and all assignments must be completed to at least a level of proficiency equivalent to a " B" in order to receive a passing grade for the course. All course assignments must be completed and submitted by the deadlines stated in this syllabus and on the Moodle. Late work will docked 25% of the total possible points for that assignment for each day it is late. You are urged to visit with the instructor with any matters regarding your assignments well in advance of their due date. You are allowed one resubmission per assignment – in other words, you can submit an assignment and obtain feedback, revise it, and turn it in a second time. Resubmission must occur within five days of the original assignment deadline.

Points will be awarded to students as follows:

Research question (4)		4 points maximum
Annotated bibliography (12)		12 points maximum
First draft of each section of paper	(4 X 10 points each)	40 points maximum
First and second draft of full paper	(2 X 15 points each)	30 points maximum

Final paper (22) — 22 points maximum

Total points possible — **100 points maximum**

Grades will be awarded using the following scale:

90 to 100% = A
80 to 89% = B
70 to 79% = C
60 to 69% = D
Less than 60% = F

8) Attendance

Regular and frequent participation in all class activities is essential in order for students to have access to a rich and comprehensive learning experience. Regular participation is also required for the successful completion of in class assignments, which contribute to the course grade and therefore the likelihood of passing the course. Absences will only be excused if the student obtains prior approval from the course instructor. More than two excused absences or any unexcused absences will result in the student failing the course.

9) Students with disabilities

Reasonable accommodations are provided for eligible students with identified disabilities. The College complies with the Rehabilitation Act of 1973 and the Americans with Disabilities Act. Students may contact the college's Disability Officer, Linda Pete, (linda_pete@skc.edu, 406.275.4968) or consult the SKC web page for Students with Disabilities for more information.

10) Academic Integrity

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by Salish Kootenai College. Violations of the college's policies (including plagiarism or other forms for cheating) may result in the student failing the course.

11) Title IX:

The U.S. Department of Education's Office for Civil Rights (OCR), enforces Title IX of the Education Amendments of 1972. Title IX protects people from discrimination based on sex in education programs or activities that receive Federal financial assistance. Title IX states that:

> No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance.

All employees at SKC are considered **"Responsible Employees"** which requires them to report incidents of gender-based discrimination (sexual violence, sexual harassment, rape,

sexual assault, domestic violence, and/or stalking). In accordance with Title IX laws, students must be made aware of the following: If any employee of SKC, including instructors, learns of any potential gender-based discrimination, they are required to notify the Title IX Coordinator, **Rachel Andrews-Gould** (275-4985, located in BigKnife Building), immediately. Once an incident is reported to Title IX, the student will be contacted by the Title IX Coordinator for follow up. Students can also report directly to the Title IX coordinator in regards to any gender-based discrimination.

If any student wants to speak with someone confidentially, the following resources are available:

Center for Prevention and Wellness Agnes Kenmille Building Building #51 406.275.4913 or 406.275.4744	SAFE Harbor Advocacy Services 24-Hour Advocacy 406.676.0800

Speaking with a confidential resource does not preclude students from making a formal report to the Title IX Coordinator if and when they are ready. In the confidential setting, students will be made aware of available resources and reporting options. An advocate is available for all students upon request through the Center for Prevention and Wellness.

12) Credit Hours

Following the SKC Credit Hour policy, to meet the identified student learning outcomes of this 3 credit course course delivered over a 10 week term, each student will spend approximately

- an average of 3 hours per week in onsite work in the college and
- an average of 9 hours per week on work outside class hours, conducting their experiment, engaging in research, and writing their homework assignments.

13) **PEPP Standards Addressed**

EDUC 301 addresses several of the Montana Professional Educator Preparations Program Standards, These standards are listed below.

10.58.522.7 - The candidate for an endorsement in broadfield science demonstrates the following knowledge and skills:

b) exploration and inquiry learning as tools in investigating all aspects of the natural environment and knows how to apply and teach these methods when instructing students;
c) systematic and quantitative study of the fundamental topics in biology, chemistry, physics, and earth science including descriptive and historical perspectives, as well as the applications of these sciences in society;
d) study and experiences emphasizing interrelationships among all the sciences, as well as between the sciences and other areas of study such as mathematics;
e) conceptual understanding of the relationships among science, technologies, and the study of environmental education;
f) designing, developing, and evaluating field, demonstration, and laboratory instructional activities, and in using special skills and techniques with equipment, technologies, facilities, and specimens which support and enhance curricula and instruction in all sciences including laboratory and field studies that promote investigation and inquiry, and the use of experimental methods;
g) facilitating classroom discourse through questioning, reflecting on, and critically analyzing ideas, leading students toward a deeper understanding of the inquiry process itself, and especially, using questions to define problems and potential solutions.

10.58.522.2 - The science endorsement requires that successful candidates:

a) demonstrate a thorough understanding of inquiry-based learning across the sciences. This preparation includes:
   iv) methods to engage in inquiry in a variety of ways;

b) demonstrate knowledge and skills in the methods of guided and facilitated learning in order to interpret and communicate science research to others;
c) apply instructional strategies which models learning environments with extended time, appropriate space, and resources with equipment and technology found in the contemporary secondary classroom;
d) demonstrate understanding and experience of how to develop and maintain the highest levels of safety in classrooms, stockrooms, laboratories, and other areas related to instruction in science;
f) apply and evaluate models of interdisciplinary approaches to provide experiences in understanding science;
g) articulate a well-defined rationale for instructional goals, materials, and actions in relation to state and national education standards and student achievement.

14) **Course Outline**

Week	General Topic	Assignments Due
1	Syllabus Overview Why Ask Good Questions? TED Talk – Mike Vaughan Overview of Research Project Rubric Writing Research Questions Conducting Literature Reviews – I	Approved research question
2	Conducting Literature Reviews – II Defining Plagiarism Writing APA Citations	Annotated bibliography for three articles relevant to your research project
3	Writing the Introduction	Introduction section
4	Writing the Methods section	Methods section
5	Representing data Writing the Results section	Results section
6	Writing the Discussion and Conclusions section	Discussion and Conclusions section
7	Writing an Abstract Formatting and putting together the full paper	First draft of full paper
8	Full paper rewrites	Second draft of full paper
9	Final paper rewrite	Final paper due
10	Supporting secondary students in understanding the Nature of Science – Revised perspectives and strategies	

1. What did I hear in the TED Talk about questions?
2. How have I experienced this in my life?
3. What does it imply about my paper and my teaching?
4. What does it call me to do?